# The Establishment of a U.S. Support Program Internship Program*

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## ABSTRACT

In 2002, the U.S. Support Program to IAEA Safeguards established a program of one-year paid internships with the IAEA Department of Safeguards for students and recent graduates. Six interns are currently working with the IAEA in software development and information collection activities. The program is administered through the International Safeguards Project Office (ISPO) at Brookhaven National Laboratory (BNL). Software development assignments were considered to be most feasible because of the considerable abilities of many computer science students after a few years' education. Candidates in information science were also recruited because of an existing internship program managed by the Monterey Institute of International Studies. ISPO recruited students from U.S. colleges and other sources. Applications were collected and provided to the IAEA for review and selection. SGIT then identified the best applicants and, after confirming their intention to accept the position, tailored assignments based on their qualifications. Before the assignments started, ISPO conducted an orientation to provide the interns with information to ease their transition into working with the IAEA and living in Vienna. Four interns began their assignments in software development in June 2002 and two others began their assignments in information collection in July and August. The IAEA, the interns, and the Subgroup on Safeguards Technical Support have found the assignments to be beneficial. The internship program provides additional staff to the IAEA at low cost to the USSP, introduces young professionals to careers in the nuclear industry and international civil service, and provides the IAEA access to U.S. academic institutions. In 2003, the program will be expanded to include engineering and technical writing in support of the Division of Safeguards Technical Services. The paper will discuss the recruitment and selection of interns and the administration of the program.

## INTRODUCTION

The U.S. Support Program (USSP) began sponsoring interns in assignments with the IAEA in 1999. The first interns were supplied to the IAEA Division of Information Technology through a contract with the Center for Nonproliferation Studies of the Monterey Institute of International Studies for the collection and analysis of open source information. In 2001, the International Safeguards Project Office (ISPO) at Brookhaven National Laboratory (BNL) began an internship program for U.S. citizens and permanent resident aliens. This paper focuses on the BNL program.

## HISTORY OF THE USSP INTERNSHIP PROGRAM

In 2001, the USSP sponsored one intern on a very short assignment in software development. This internship demonstrated the skills and capabilities that recent graduates of computer science programs could apply to IAEA software needs. As a result, the IAEA and the USSP agreed to begin an internship program in 2002. The program began with computer science majors because they have skills that enable them to complete a usable product in a relatively short time.

* This work performed under the auspices of the U.S. Department of Energy, Contract No. DE-AC02-98CH10886.

In the summer of 2002, six interns began assignments in the Division of Safeguards Information Technology (SGIT). Two of the interns were given assignments in information collection and four were assigned to software development projects. ISPO recruited the interns from colleges, universities and technical schools around the United States.

Shortly after these internships began, ISPO began recruiting candidates for positions to begin in 2003. The scope of the program was expanded to include engineering and physics majors. In June and July 2003, eight interns began assignments in the Divisions of Information Technology, Technical Services (SGTS) and Operations A (SGOA). These assignments will be completed during the summer of 2004.

ISPO has already begun recruiting candidates for positions starting in 2004. The application deadline for 2004 is November 15, 2003.

**OBJECTIVES**

The internship program meets several USSP objectives:

- Introduce the next generation to the nuclear industry and the IAEA
- Establish entry level positions in the IAEA
- Provide cost effective labor to the IAEA

In addition to managing the USSP, ISPO has responsibility for recruiting candidates for regular staff positions at the IAEA Department of Safeguards. As the nuclear industry in the United States, as well as around the world, ages, it is necessary to attract younger people to the industry. Technical personnel with specific training in nuclear technologies, as well as support personnel, are needed to staff U.S. nuclear facilities and to continue the work of the IAEA. The internship program can serve to raise awareness of and interest in the nuclear industry. Hopefully, interns involved in the program will consider the IAEA and the nuclear industry for future employment.

For interns in the information collection positions, the experience gained working on safeguards-related issues represents valuable training that may be applied in nonproliferation analysis positions with the U.S. government, in non-governmental organizations, or in academia. This increases the breadth and depth of nonproliferation knowledge available and contributes to strengthening the nonproliferation regime.

Most regular staff positions at the IAEA require six years' experience. One impediment to raising awareness of the IAEA among college students is that there are few entry-level positions open to them. The internships offer an opportunity for students and recent graduates to work with the organization before they have accumulated the experience required for regular staff positions.

In recent years the IAEA has experienced a shortage of human resources due to its constrained budget. Interns can assist the organization by performing routine, yet important, tasks allowing the regular staff to concentrate on activities that require more experience and expertise. The USSP finds that interns provide cost-effective technical support – especially in software development where large projects can be divided into small, individual tasks.

## RECRUITMENT OF CANDIDATES

The USSP originally recruited candidates for computer science positions because these positions provide a good opportunity to perform productive work for the IAEA. IAEA staff members are very busy. Any human resources provided must be somewhat self-sufficient because the staff members have limited time to assist them. Moreover, interns in software development would be able to complete a software module during the course of an internship. In the second year, we broadened the recruitment to include mechanical, electrical and nuclear engineering and physics majors because we were able to define similar, productive scopes of work.

Various factors influence the outcome of ISPO recruitment efforts. Our ability to interact personally with students and college personnel is limited due to time and budget constraints. Predominantly we rely on correspondence, word of mouth, and advertisements. However, in the past two years ISPO staff have visited The Chubb Institute, the State University of New York at Stony Brook and Old Westbury, the University of California at Berkeley, Texas A&M, and Rensselaer Polytechnic Institute. In addition we have attended INMM, American Nuclear Society, and Society of Women Engineers national meetings and have placed advertisements in their journals. To a certain extent ISPO can combine its intern and regular staff recruiting activities, but the target audiences are quite different.

Interested candidates are required to submit an application consisting of a resume and two letters of recommendation. Applicants are also encouraged to submit a sample of their work. Most applications came from students we met at trade shows or who attended schools that we visited. However, some of the candidates heard about the opportunity from POTAS contractor representatives and had no personal contact with ISPO. For positions beginning in 2003, ISPO collected seven applications in information collection and analysis, 25 applications in computer science and 17 applications in engineering and technical writing.

## INTERN SELECTION

ISPO collects applications and categorizes them into appropriate subject areas. Resume books are provided to the IAEA, which takes responsibility for selecting the interns. Specific assignments are defined during the review of the resumes. ISPO encourages the IAEA to interview the candidates by phone, or in person if the candidates visit Vienna.

After reviewing the resumes, the IAEA gives ISPO a list of defined positions and a prioritized list of candidates for each defined position. In 2003 the IAEA proposed ten positions. ISPO then contacts the first candidate for each position to confirm that they are still interested in the position. ISPO continues to contact applicants until each of the positions is filled.

Since different IAEA Divisions are reviewing the same applications, the same applicant can be selected for more than one position. In these cases the applicant can select the position that he or she prefers. Despite the fact that the IAEA defined ten assignments for 2003, only eight were filled due to the availability of interns and the competition between Divisions.

## ASSIGNMENTS

In 2002 and 2003, the USSP sponsored a total of 14 internships. The assignments are in software development, information collection and analysis, technical writing, and equipment procurement and management. The assignments have been organizationally positioned in the Sections for Software and Hardware (ISH) and Information Support Services (IIS) in the SGIT, the Sections for Installed Equipment (TIE), NDA and Seals (TNS), and Common Technical Services in SGTS, and in the JNFL Project in SGOA.

The assignments are defined by an initial scope of work. The interns are encouraged to identify additional places where they feel they can contribute. The scope of the assignments is discussed below.

### *Software Development*

To date, there have been six software development interns working in ISH and the JNFL Project. Each of these interns works in a team with IAEA staff members on a specific software development project. The intern has responsibility for a particular part of the project and meets frequently with the team members. The interns have been assigned to projects such as the Additional Protocol System, the Equipment Management Information System, the Common Inspection On-Site Package, the web-based Computerized Inspection Report, and the Task Assignment and Time Reporting (TATR) system. Their work must adhere to the procedures of SGIT's Software Engineering Process.

For 2003, the JNFL Project requested an intern to help develop the Integrated Inspector Information System (I3S) for the Rokkasho Reprocessing Plant (RRP) Safeguards system. The I3S effort offers a chance for the intern to work in nearly all phases of a large, multi-vendor software development effort. The intern will assist with system documentation, component and system integration testing, testing system setup and test documentation, design and development of diagnostic tools, integration and installation of the system at RRP, and prototyping new user interface concepts.

### *Information Collection and Analysis*

There have been two information collection and analysis interns working in the ISS under the BNL program. A third will start in July 2003. Eleven other interns have been provided since 1999 under a USSP-sponsored contract with the Monterey Institute of International Studies. These interns were assigned to assist the IAEA with the collection of open source information. They produce a collection of news articles known as the Daily Highlights and they assist in the collection of information for country files, as well as contributing short research briefs and analyses in support of the state evaluation process.

One of the interns was assigned to maintain the Illicit Trafficking Database. The database is a collection of reports of illicit trafficking events. The intern conducts follow-up research on reported incidents, adds new records, and modifies and corrects existing records, working closely with the professional staff member responsible for the database. While responsibility for nuclear security (including illicit trafficking issues) is now the responsibility of the Office of Nuclear Security in the Department of Nuclear Safety and Security, responsibility for data collection and entry into the database remains with SGIT.

Most of the students selected for these positions have backgrounds in political science and have studied nonproliferation issues before joining the IAEA. The advanced research and information collection skills of these interns allow them to make a major contribution to the section's work.

***Technical Writing***
Technical Writing assignments have been established for 2003 in the TIE and TNS. The interns will assist the IAEA with the preparation of procedures needed for safeguards equipment. The equipment to be addressed in these assignments will be nondestructive analysis, surveillance and equipment related to the application of seals. In order to write the procedures the interns will have to develop a thorough understanding of the operation of the instrument and may also be involved in testing.

***Equipment Procurement and Management***
Two interns will be assigned to TIE to assist with management and testing of surveillance systems. The interns will spend time familiarizing themselves with the equipment. One intern will work with IAEA staff members to formulate test procedures, participate in testing and analyze data. The other intern will assist in the development and use of the Section's technical database and will formulate and document the integration of surveillance and unattended monitoring system equipment.

Another intern is assigned to the Section for Common Technical Services where she will assist with the modification and streamlining of procurement procedures.

**LOGISTICS**
The IAEA prefers internships to be one year in duration. The IAEA must invest one or two months of effort to train the interns before they can work productively on their own. An assignment of one year enables them to realize a return on their investment. To date, one BNL internship has been less than one year in duration. (Internships through MIIS are routinely less than one year in duration.) In 2002, all interns started their assignments after completion of their studies. In 2003, three of the interns are taking a break from their studies to participate in the internship.

The USSP offers a stipend that is competitive with salaries that might be offered by industry. This is to ensure good quality applicants and to ensure that the interns have sufficient resources to support themselves in Vienna. An advance on the stipend is provided prior to departure to ensure they have some money for initial expenses such as temporary housing and public transportation. In addition, the USSP provides round trip airfare and in 2003 is offering a small allotment for shipment of personal belongings. The interns must pay all other expenses from their stipend. The USSP does not reimburse the intern for housing, and we require that they purchase medical insurance prior to departure. Interns are not eligible for most benefits extended to regular staff and cost free experts such as pension, education grants, or the use of the commissary.

In order to help the interns prepare for their transition to Vienna and their assignment, ISPO offers a one-day orientation at BNL. Travel to the orientation is paid by the USSP, and ISPO invited one of the experienced interns to participate in the orientation. The orientation provides an overview of the IAEA and the USSP and addresses aspects of living in Vienna such as temporary housing, permanent housing, money and banking, and public transportation. A short German lesson

demonstrates the importance of learning the language, and ISPO gives each intern a set of language CDs.

ISPO is supported in the administration of the internship program by BNL's Office of Educational Programs (OEP), which has experience administering other internship programs at BNL for the Department of Energy. OEP established a mechanism for making monthly payments to the interns' bank accounts in addition to handling their travel arrangements. As the program matures, ISPO hopes to transfer responsibility for the internship program to OEP.

**LESSONS LEARNED**

ISPO is taking note of inefficiencies and inconveniences in the administration of the internship program with the aim to correct them as the program matures. To date the following "lessons learned" have been identified:

- The internship program is a cost effective mechanism for providing technical support to the IAEA. Interns can produce a usable product during their one-year assignments.
- The use of the term "intern" for these assignments may be incorrect. IAEA staff members do not have significant time to mentor interns and expect the interns to be productive during their assignments. Also, providing a competitive salary is inconsistent with the IAEA's compensation of interns. In the future, we may consider using a different term.
- Interns adapt to living in Vienna more easily than CFEs. They easily establish a network of friends and have lower expectations. However, they can benefit from some support during their first months in Vienna. For this reason ISPO will include interns in the host family program, which pairs a U.S. citizen already working at the IAEA with a new employee from the United States. This will also provide a point-of-contact with whom the intern can correspond prior to arrival in Vienna.
- The IAEA must plan for the integration of the interns into their projects and ensure that the Project Leaders invest time in familiarizing them with the project and teaching them the expected working practices in order to benefit from their full potential in the following months.

Besides the satisfaction of the IAEA and the interns in the assignments, two measures of the success of the internship program are the ability of interns to obtain suitable employment upon the completion of their assignments and their interest or success in finding employment at the IAEA or in the U.S. nuclear industry in the future. Since the first full year of internships has just recently concluded, it is too early to judge success in these terms. However, of the six interns completing assignments in 2003, one has become as a consultant for the IAEA with an initial six-month assignment, one is going to graduate school, one will begin a job with a Department of Energy contractor, and one found work in the private sector.

**SUMMARY**

The USSP began an internship program in 2001 to support the IAEA Department of Safeguards and to increase awareness of job opportunities in the nuclear industry as well as with the IAEA. Since that time fourteen interns have begun assignments with the IAEA in the Divisions of Information Technology, Technical Services, and Operations A. The USSP provides a competitive stipend, round trip airfare and a modest shipping allowance. The USSP's experience sponsoring internships

has been positive. Recent graduates in computer science, information technology, political science, engineering and physics have sufficient and relevant skills to assist the IAEA in addressing its technical needs. ISPO plans to use lessons learned to improve the program for future years. Two indications of the success of the program are the ability of interns to find suitable employment following their assignments and the eventual return of these interns to the IAEA or the U.S. nuclear industry. ISPO will collect information related to post-internship assignments and distribute information related to IAEA vacancies to former interns.